

COVID-19 infodemic and Indonesian emotional and mental health state

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ABSTRACT

The currently ongoing coronavirus disease 2019 (COVID-19) pandemic induced built-up fear and anxiety notably with non-stop surge information through all media. Understanding of emotional and mental health impact during this state is urgently needed for further intervention. This study aimed to identify the current pattern of depression, anxiety, stress and, emotional disorder presented in the society and the association between Indonesian news-seeking behaviour and their mental health state during the COVID-19 outbreak. A cross-sectional study with 1,508 respondents was carried out with online questionnaire consisted of depression, anxiety, and stress scale (DASS) and SRQ-20 as assessment tools that was distributed through social media platforms from April 2–June 8, 2020. Data was analyzed using Mann Whitney, Kruskal Wallis, Post Hoc with Bonferroni, and Chi-square test ($p<0.05$). As much as 20.7% of respondents were depressed, 36.9% had anxiety, 25.5% had stress, and 27.6% had emotional disorder. Most respondents actively searched about COVID-19 especially through television and social media platforms such as Twitter, Facebook, and Instagram. Type of news and level of trust in COVID-19 news were the factors that influenced emotional and mental health state ($p=<0.05$). Providing mental health support in a timely and appropriate manner through a hotline team, media, or multidisciplinary team, including mental health professional is an important thing that the Indonesian government must do to help the Indonesian people through this pandemic.

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1. INTRODUCTION

Coronavirus disease 2019 (COVID-19), caused by novel coronavirus, is an emerging respiratory disease and is considered a worldwide threat. This highly infectious disease was first reported in December 2019 in Wuhan (China) with its main clinical symptoms of fever, dry cough, fatigue, myalgia, and dyspnea [1], [2]. As of 6th June 2020, World Health Organization (WHO) has shown that overall global case fatality rate of COVID-19 is 5.9% [3], [4]. Ministry of Health in Indonesia stated that 29,521 people was tested positive for COVID-19 where 9,443 people have recovered and 1,770 people have died with 6.0% case fatality rate [5].

WHO has stated that since the onset of the epidemic outbreak, it is necessary to engage the community through radio-based activities and seek cooperation in order to ensure that the population is prepared to take precautions at individual level [6]. The term 'infodemic' was used by WHO to describe COVID-19 along with its escorting news as well as ambient hoax [7]. Due to massive circulating news, people are becoming more alert and eager to find the latest news from various platforms.

The advancing COVID-19 pandemic is raising concern and understanding emotional and mental health status is urgently needed in the society [8]. Preceding research had revealed a profound and wide range of psychosocial impacts on individuals, community, and international levels during outbreaks of infection. On an individual level, people are likely to experience fear of being sick, dying or helpless [9]. Around 10-30% of the societies were very or fairly worried about the possibility of being in contact with the virus. With the closure of schools and business, individuals experienced complex negative emotions [10], [11]. From the past 2 pandemics that were also caused by the coronavirus, many studies that investigated the psychological impact on the non-infected community revealed significant psychiatric morbidities which were found to be associated with younger age and increased self-blame [12]. If those reactions cannot be relieved in time, they are likely to lead to further irrational and violent behaviours.

Currently, there is no known information on the emotional and mental health of the society during the COVID-19 pandemic in Indonesia. A high level of awareness and curiosity about the COVID-19 latest news and its impact on emotional and mental health status were the interest of this research. This study aimed to identify the current pattern of depression, anxiety, stress and emotional disorder presented in society and the association between Indonesian news-seeking behaviour and their mental health state during the COVID-19 outbreak. This may assist government agencies and healthcare professionals in safeguarding the psychological wellbeing of the community to face COVID-19 epidemic expansion in Indonesia.

2. RESEARCH METHOD

An observational analytic study with a cross-sectional approach was designed for the present study. The population is Indonesian internet users with 1,508 participants who responded to online questionnaires distributed through social media platforms on April 2-25, 2020. The depression, anxiety, and stress scale (DASS) questionnaire is a self-report measurement tool that measures depression, anxiety, and stress. DASS-42 consists of 42 questions about symptoms of negative emotions in which the individual assesses the presence or absence of these symptoms in the past week. The DASS-42 questionnaire in this study has been translated into Bahasa Indonesia and has excellent value in both validity and reliability test which is 0.499-0.813 and 0.90 successively. By using this questionnaire, participants were given a choice of 0-3 score to answer which will then be calculated and interpreted as 'depression' and 'no depression', 'anxiety' and 'no anxiety', and 'stress' and 'no stress'. Respondents were categorized as depression, anxiety, and stress for scores above 9, 7, and 14 consecutively.

Self-reporting questionnaire (SRQ) developed by WHO was used in this study as an emotional disability measurement tool to only screen for mental-emotional disorders. The SRQ questionnaire in this study has been translated into Bahasa Indonesia by the Indonesian Ministry of Health in the study of Idaiani *et al.* in 2009 [13]. The questionnaire was tested for validity by Ganihartono with a score of 0.88. The SRQ questionnaire consisted of 20 questions raised on neurosis problems consisting of depression, anxiety, somatic, cognitive, and energy reduction with a 'yes' score for 1 question worth 1 point. The cutoff value that has been determined in this questionnaire is 6, which is considered an emotional disability [14].

Data were collected through interview using a closed-question questionnaire and one open-question. Then it proceeded to the process of checking/validating data, coding, recapitulation, tabulation, and statistically analyzed using the IBM SPSS Statistics 24 program. Bivariate data analysis was used in this study to analyze the relationship of Indonesian news-seeking behavior to the psychological and emotional impact of COVID-19 with Mann Whitney, Kruskal Wallis, Post Hoc with Bonferroni, and Chi-square test ($p < 0.05$).

This research was approved by Mohammad Hoesin Central General Hospital and Faculty of Medicine Sriwijaya University Health Research Review Committee (IRB No.141/kepkrsmhfkunsri/2020). All respondents were informed of the study and provided consent before enrolling. Attribute codes were given to the participants to maintain anonymity.

3. RESULTS AND DISCUSSION

In this study, out of 1,508 respondents, 20.7% were depressed, 36.9% had anxiety, 25.5% had been stress, and 27.6% had an emotional disorder as shown in Figures 1 and 2. The socio demographic characteristics of respondents towards mental health states are shown in Table 1. Table 1 shows that almost all socio-demography factors have a significant relationship with depression, anxiety, and emotional disorder on

participants (p-value <0.05). Post hoc Bonferroni analysis showed that the average total score among depression was greater in female vs male (2,378), single vs married (2,378), Senior high school vs Master degree (3,196), student vs entrepreneur (3,704), non-health vs health background (798.8), and monthly expense <1,000,000 vs >10,000,000 (3,719). While, the anxiety, stress, and emotional disorders were greater in female vs male (780.7 for anxiety; 774.9 for stress; 677.4 for emotional disorders), single vs married (2,244 for anxiety, 2,457 for stress; 1,291 for emotional disorders), senior high school vs master degree (2,802 for anxiety, 3,355 for stress; 2,157 for emotional disorders), non-health vs health background (806.9 for anxiety; 801.1 for stress; 706.4 for emotional disorders), and monthly expense <1,000,000 vs >10,000,000 (2,992 for anxiety; 3,402 for stress; 2,517 for emotional disorders), and there is no difference among occupation group. The news dissemination of COVID-19 on Indonesian emotional and mental health state is shown in Table 2.

Table 1. Sociodemographic characteristics of respondents (n =1,508)

Sociodemographic characteristics	Mental health status				Emotional disorder Mean ± SD	p-value
	Depression Mean ± SD	p-value	Anxiety Mean ± SD	p-value	Stress Mean ± SD	p-value
Gender						
Male	5.3 ± 6.8	0.215	6.3 ± 6.1	<0.0001*	8.5 ± 8.2	0.005*
Female	5.6 ± 7.0		7.5 ± 6.8		10.4 ± 8.3	4.2 ± 4.3
Marital status						
Single	6.0 ± 7.3	<0.000	7.6 ± 6.8	<0.0001*	10.6 ± 8.4	<0.000
Married	3.6 ± 4.7	1*	5.4 ± 5.8		8.1 ± 7.2	1*
Divorced	5.6 ± 6.4		6.6 ± 6.9		10.8 ± 9.2	4 ± 4.6
Education level						
Elementary School	2.8 ± 5.1		4 ± 3.3		2.2 ± 2.6	2 ± 2.9
Junior High School	8.1 ±		9.8 ± 8.4		11.7 ± 9.1	5.3 ± 5.2
Senior High School	10.9	<0.000	8.1 ± 7.0	<0.0001*	10.8 ± 8.5	4.8 ± 4.6
Bachelor degree	6.6 ± 7.8	1*	6.9 ± 6.4		10 ± 8.2	3.6 ± 3.8
Master degree	5.2 ± 6.4		5.3 ± 6.2		7.5 ± 6.9	2.6 ± 3.8
Doctoral degree	3.4 ± 4.8		1.5 ± 1.1		2.5 ± 2.7	0.2 ± 0.4
0.8 ± 1.0						
Occupation						
Unemployed	6.9 ± 8.1		8.0 ± 7.5		11.3 ± 8.7	4.4 ± 4.3
Employee	4.6 ± 5.8		6.3 ± 6.2		9.2 ± 8.0	3.5 ± 3.9
Entrepreneur	3.9 ± 4.6	0.004*	6.3 ± 5.4	0.019*	9.6 ± 7.1	0.048*
Pensionary	6.8 ± 6.6		6.6 ± 6.0		10.3 ± 6.9	2 ± 2.1
Students	7.6 ± 9.7		8.2 ± 7.4		11.6 ± 9.5	4.7 ± 5.0
College students	5.8 ± 7.1		7.4 ± 6.7		10.2 ± 8.2	4.1 ± 4.2
Educational/occupational background						
Health	5 ± 6.7	<0.000	6.4 ± 6.3	<0.0001*	9.2 ± 8.0	<0.000
Non-Health	6.2 ± 7.1	1*	7.9 ± 6.8		10.9 ± 8.4	3.5 ± 4.0
Monthly expenses (rupiah)						
<1.000.000	6.1 ± 7.2		7.7 ± 6.6		10.5 ± 8.1	4.3 ± 4.3
1.000.000-2.000.000	5.7 ± 7.2	<0.000	7.4 ± 6.6		10.2 ± 8.3	4.0 ± 4.2
>2.000.000-5.000.000	5.5 ± 6.9	1*	7.0 ± 6.6	<0.0001*	10.2 ± 8.4	0.016*
>5.000.000-10.000.000	5.0 ± 6.2		6.4 ± 6.9		9.5 ± 8.1	3.9 ± 4.0
>10.000.000	2.4 ± 3.5		4.7 ± 5.6		7.1 ± 7.8	3.5 ± 4.3

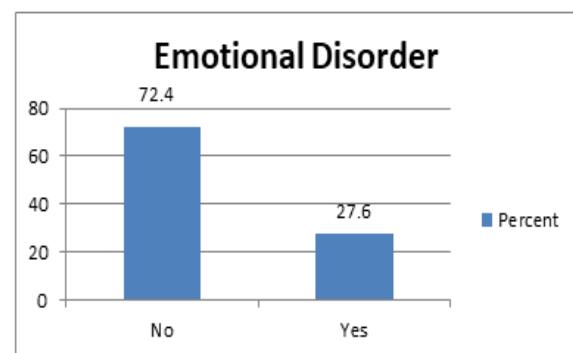
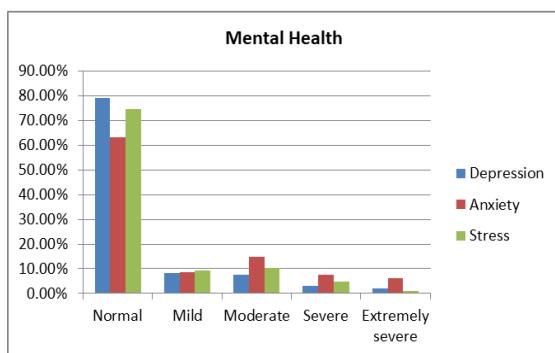


Figure 1. Prevalence of mental health state (n=1,508)

Figure 2. Prevalence of emotional disorder (n=1,508)

Table 2. The news dissemination of COVID-19 and mental health state (n=1,508)

News dissemination	Mental health status					Emotional disorder (n, p-value)		
	Depression (n, p-value)	Anxiety (n, p-value)	Stress (n, p-value)					
Update on the latest news								
Yes	289	0.000*	523	0.002*	361	0.008*	391	0.011*
No	24		33		24		25	
Sources								
Television (n=1,012)	187	0.020*	355	0.045*	243	0.062	260	0.022*
Online news (n=1,093)	224	0.737	405	0.857	279	0.995	305	0.700
Facebook (n=218)	38	0.223	67	0.042*	42	0.027*	61	0.953
Whatsapp group (n=606)	116	0.229	217	0.518	160	0.564	156	0.210
Twitter (n=396)	111	0.000*	175	0.001*	128	0.000*	144	0.000*
Instagram (n=870)	179	0.839	339	0.049*	247	0.004*	252	0.180
Youtube (n=438)	83	0.300	156	0.557	113	0.930	119	0.866
Line (n=513)	95	0.141	184	0.601	130	0.953	136	0.542
Radio (n=60)	7	0.108	19	0.474	11	0.249	9	0.038*
Friends/family (n=643)	132	0.902	241	0.712	181	0.045*	178	0.989
Others (n=8)	3	0.374	3	0.970	1	0.972	2	0.868
Type of news								
New cases (n=957)	262	0.680	465	0.463	321	0.485	347	0.472
Mortality rate (n=1,042)	234	0.459	411	0.554	294	0.092	303	0.954
Recovery cases (n=1,031)	218	0.722	394	0.922	266	0.484	288	0.503
Preventive measures (n=543)	165	0.019*	305	0.024*	206	0.020*	212	0.000*
Donation (n=342)	97	0.708	180	0.871	129	0.511	130	0.735
Government new regulation (n=468)								
Symptoms (n=321)	206	0.799	361	0.326	254	0.819	282	0.580
Medicine (n=98)	141	0.505	263	0.845	177	0.723	180	0.093
Comorbid (n=89)	29	0.605	57	0.969	37	0.723	47	0.445
Vaccine (n=97)	32	0.224	75	0.368	44	0.561	52	0.942
Local repatriated (<i>mudik</i>) (n=245)	54	0.622	88	0.832	70	0.248	65	0.777
	67	0.113	107	0.448	82	0.077	94	0.007*
Trust in news								
Yes	198	0.000*	386	0.000	253	0.000*	283	0.000*
No	22		41		31		88	
Unsure	94		129		101		274	

* p-value<0.05, using Pearson chi-square if expected count <20% (Table>2x2)

People who were updated to the latest news of COVID-19 felt a significant impact on the mental and emotional health status (p-value <0.05). Television, as one of the news sources, has a significant relationship with depression, anxiety, and emotional disorder on participants (p-value <0.05). Using social media to look up information of COVID-19 has a big role in the mental health of participants. It is presented that Twitter had a significant association with depression (p-value <0.05) and emotional disorder (p-value=0.000), while Facebook, Twitter, and Instagram had a significant association with anxiety and stress (p-value <0.05). The table also showed that friends and family had a significant relationship with stress on participants (p-value=0.45). Though only a few participants used radio, a significant association was presented with emotional disorder (p-value=0.038). Only preventive measurements of COVID-19 information had a significant relationship to all mental and emotional health state while local repatriation (*mudik*) had a significant relationship only with emotional disorder (p-value <0.05). The level of trust of COVID-19 news also has a significant association with the mental and emotional health state of participants

The prevalence of mental and emotional disorders as indicated by symptoms of depression and anxiety reached 14 million people or 6% of the Indonesia population in 2018 [15]. In this study, out of 1,508 samples, 20.7% were depressed, 36.9% had anxiety, 25.5% had been stress, and 27.6% had an emotional disorder. These results indicate that there is an increasing prevalence of mental and emotional disorders during the COVID-19 pandemic. This study displayed that news dissemination of COVID-19 was related to emotional and mental health during the COVID-19 pandemic. Amid this condition, the media in Indonesia always tried to provide updated information about the current situation from online news portals, print media, and social media platforms. The increasing COVID-19 cases in Indonesia as well as policies related to the pandemic issued by the government had triggered people's information-seeking behavior regarding their health risks, diseases, and behavior [16]-[17]. Previous research had shown that there was a tendency to increase the trend of community searches related to COVID-19 from various factors [18]-[19].

Searching for news through online news channels was more common while information from television ranked second. It was not surprising as the spread of COVID-19 information from television occurred every day and was in prime time. The rapidly growing digital era caused the dissemination of

information to be faster and easier, one of which was access to information via the Internet. In line with a survey conducted by the Indonesian Internet Service Providers Association (APJII), out of 143.26 million or 54.68% of the total population in Indonesia use the Internet service in 2017 and increased to 171.1 million in 2018 [20], [21]. Internet services made it easier for the public to obtain information related to COVID-19 both from social media and search engines. In addition, some people had a habit of using the Internet to read articles (55.30%) and to seek health-related information (51.06%) [22].

Although news dissemination were mostly sourced on online news channels and WhatsApp, mental and emotional health disorders were related to news dissemination via television, Facebook, Twitter, Instagram, radio, and through friends/family. Facebook, Instagram and Twitter are the most frequently used by Indonesian people when using the internet. Most Indonesians use the internet for social media (51.5%) and communicate via messages (32.9%) [21]. This can lead to a high prevalence of mental health disorders due to overexposure to social media [23], [24]. The floods of headlines available about COVID-19, that can access in various media, and continuously reported was filled with the dangers of COVID-19, the increasing number of cases, the scarcity of resources, up to the social and economic that were affected had triggered alertness and excessive concern in the community [25]-[26].

Today, television, online sites, and social media platforms were important in broadcasting information during the outbreak of COVID-19. The Centers for Disease Control and Prevention, WHO, numerous journals, and other health care organizations regularly posted guidance across diverse platforms. Teams employed by larger social media platforms had also been involved as searches for Coronavirus information escalated and, at times, dominating conversations online [27], [28]. Facebook was using the news feed function to direct users to the WHO and local health authorities websites [27]. Google Scholar had highlighted leading medical journals and other sites while Twitter and other social media were similarly routing individuals (accounting for misspellings) to reliable resources related to coronavirus [28]. Health care organizations, clinicians, and social media influencers should also actively direct internet users to trusted sources.

This study showed that the type of news in the form of preventive measures effected on mental health symptoms and emotional disorders. This was in line with previous research where high levels of mental health symptoms were associated with COVID-19 prevention efforts [29], [30]. Information seeking was an attempt to bridge the knowledge gap. In the context of seeking information about health (a preventive measure), a person may not know clearly about a particular health problem that described a knowledge gap about a disease, so there was a need to seek detailed information about the problem [31]. This is in contrast to the theory that stated the information-seeking was carried out to reduce stress and uncertainty in the face of threats (such as health problems) [32]. The news dissemination of local repatriated (*mudik*) also affects a person's emotional disorder. The prohibition of local repatriated (*mudik*) lead to restricted social relations and cannot assemble with family, resulting in feelings of loss and loneliness, which potentially worsens individual emotions in situations full of threats, uncertainty and ambiguity such as the COVID-19 pandemic [26].

Social media should be used to spread reliable information on preventive measures, when to get tested, what to do with the results, and where to receive care. If a vaccine becomes available, the same platforms could be used to encourage uptake and address challenges associated with vaccine hesitancy. Health systems may become overwhelmed as testing becomes more available and as more mildly ill yet concerned individuals seek care, social media platforms are well poised to enable users to remotely assess symptoms and determine their most appropriate course of action using telemedicine [33], [34]. However, social media such as Facebook, Twitter, YouTube, and WhatsApp has also become a conduit for spreading both rumours and deliberate misinformation that many perpetrators are deploying to create a sense of panic and confusion [33]. Dissemination of health-related fake news can endanger someone's safety because lured to take the wrong precautions [35].

During the COVID-19 outbreak, mental health burden was identified. Younger people spent too much time thinking and searching about the outbreak while healthcare workers were at high risk of mental illness. If this continues, the community will fall into mental disorders in the future. Controlling and limiting the time to obtain COVID-19 related news within two hours a day, focus only on the necessary information such as facts and data and avoid receiving too many harmful rumours could be implemented to deal with this pandemic [36]. Continuous surveillance of the psychological consequences due to outbreaks should be a routine as a part of worldwide vigilance. Psychological first aid could be delivered through chatbots equipped with artificial intelligence in response to the pandemic and better understand critical needs. While social media cannot replace in-person contact, there may be ways to use it to support recovery and resilience, so people will have an idea about their health and have the right protection [37].

This study had several limitations. The study was limited to the COVID-19 outbreak where an online questionnaire was used to avoid possible infections thus sampling in the study was voluntary and

conducted by an online system. Therefore, the possibility of selection bias should be considered. Furthermore, writers were unable to assess the individual's psychological conditions of the respondents before the outbreak due to the sudden occurrence of the disaster.

4. CONCLUSION

News dissemination of COVID-19 affects the emotional and mental health status of Indonesian society. Latest news, news sources such as television and social media, type of news, and level of trust in COVID-19 news were the ones that influenced it. Indonesian government should provide appropriate tailored mental health support through hotline teams, media, or multidisciplinary teams, including mental health professionals to help Indonesian society through this pandemic.

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